Appl. No. 09/684,488
Amdt. dated October 29, 2003
Reply to Office Action dated July 31, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

RECEIVED
CENTRAL FAX CENTER

OCT 2 9 2003

OFFICIAL

1.-20. (Cancelled).

21.   (New) A system for clustering data comprising:

a computer executing a computer program performing at the following steps:

(a)   receiving into the computer a plurality of data points for clustering;

(b)   receiving into the computer a size parameter for specifying the number of data points to be moved at one time;

(c)   clustering the data points by using the size parameter to generate clustered results;

(d)   determining whether the clustered results are satisfactory;

(e)   when the clustered results are satisfactory, stop clustering;

(f)   otherwise when the clustered results are not satisfactory, revise the size parameter, perform clustering based on the revised size parameter and the clustered results, and proceed to step (d).

22.   (New) The system as defined in claim 21 wherein step (c) of the computer program further comprises:

(c1)   evaluating subsets of data points in each cluster for moving into every other cluster by using a predetermined metric; wherein the number of data points in the subset is specified by the size parameter.

111158.01/2162.10500   Page 2 of 9

Appl. No. 09/684,488
Amdt. dated October 29, 2003
Reply to Office Action dated July 31, 2003

23.   (New) The system as defined in claim 22 wherein step (c1) of the computer program further comprises:

   (c1_1)   determining a geometric center of the subset of data points being evaluated for a move;

   (c1_2)   using the geometric center of the subset of data points in the predetermined metric to generate a value.

24.   (New) The system as defined in claim 23 wherein step (c1) of the computer program further comprises:

   (c1_3)   determining whether the value is greater than zero;

   (c1_4)   when the value is greater than zero, moving the subset of data points from a Move_From cluster to a Move_To cluster;

   (c1_5)   when the value is not greater than zero, determining if there are more subsets to evaluate;

   (c1_6)   when there are more subsets to evaluate, proceeding to step (c1);

   (c1_7)   when there are no more subsets to evaluate, determining whether any point has moved;

   (c1_8)   when a point has moved, proceeding to step (c1); and

   (c1_9)   when no point has moved, stopping the processing.

25.   (New) The system as defined in claim 24 further comprising:
   wherein each data has a membership with one cluster; and
   wherein step (c1_4) of the computer program further comprises simultaneously updating the membership of at least two data points from the membership of the Move_From cluster to the membership of the Move_To cluster.

26.   (New) The system as defined in claim 24 wherein step (c1_4) of the computer program further comprises:
   updating the count of the Move_From cluster;
   updating the center of the Move_From cluster;

Appl. No. 09/684,488
Amdt. dated October 29, 2003
Reply to Office Action dated July 31, 2003

updating the count of the Move_To cluster;

updating the center of the Move_To cluster.

27.   (New) The system as defined in claim 21 wherein in the computer program, revising the size parameter of step (f) further comprises (f_1) decreasing the size parameter.

28.   (New) The system as defined in claim 21 wherein step (d) of the computer program further comprises:

(d_1)   employing a predetermined metric for determining whether the clustered results are satisfactory; wherein the predetermined metric includes a geometric center of the subset of points that are being evaluated for move.

29.   (New) The computer readable medium of claim 28 wherein the predetermined metric of step (d_1) of the computer program comprises the following expression:

where U is the subset of data points being evaluated for the move, $|U|$ is the size of U that is specified by the size parameter, m_{oo} is the geometric center of U, M_i and m_j are the centers of the clusters and n_i and n_j are the counts of the clusters.

30.   (New) The system as defined in claim 21 wherein the system is utilized in one of a data mining application, customer segmentation application, document categorization application, scientific data analysis application, data compression application, vector quantization application, and image processing application.